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Supplementary Information

Elucidating the deprotonation of polyaniline films by X-ray photoelectron spectroscopy

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1. Elemental composition of PANI films by XPS

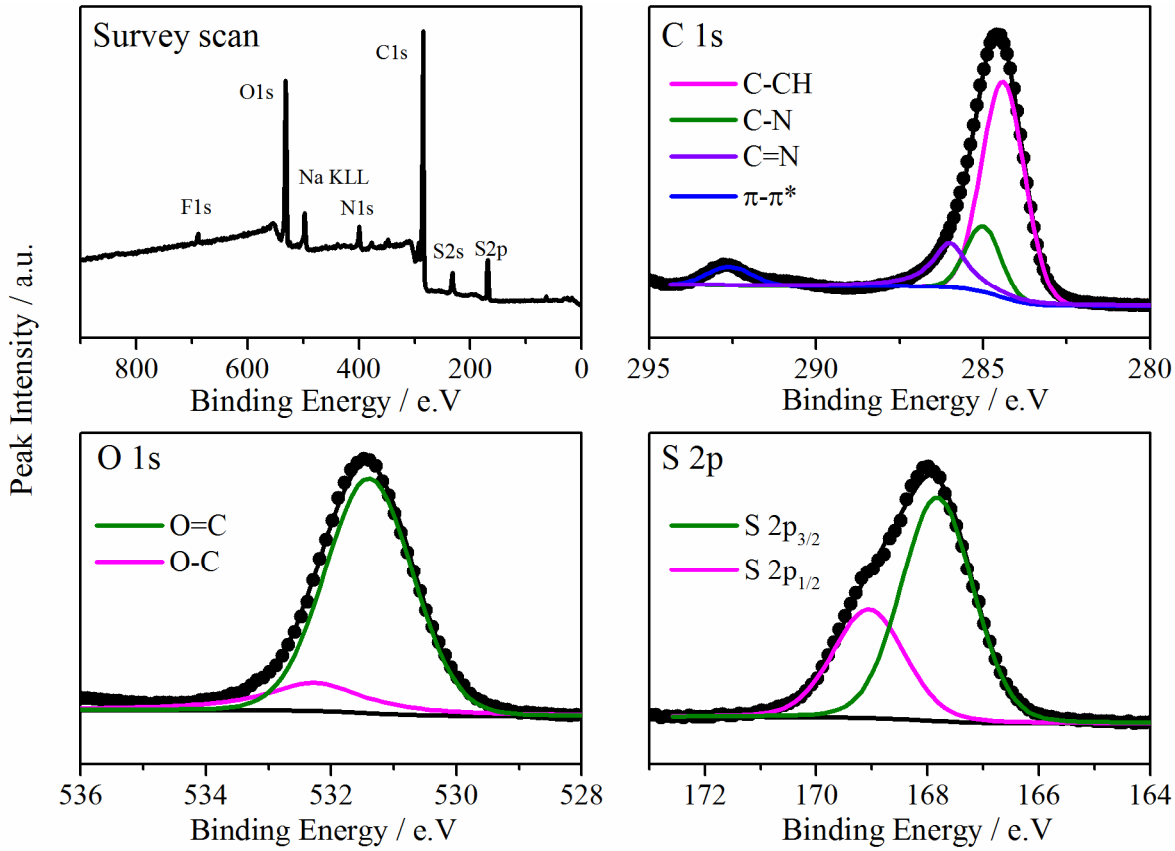

Fig. S1: An example of survey spectra and high resolution fitted curve of elements of *p*TSA-doped PANI film at fabrication**.** C 1s has been fitted to have C-CH, C-N, C=N and π-π*. O 1s spectra fitted to have O=C and O-C. S 2p spectra shows spin doublet which are S $2p_{3/2}$ and S $2p_{1/2}$.

Table S1: The elemental composition of PANI films at fabrication and post incubation in PBS

Film	Incubation Time (hours)	C (%)	N (%)	O (%)	S (%)
*p*TSA-doped PANI	0	68.3	5.1	23.2	3.4
	0.5	79.8	12.6	7.6	0.05
	24	81.7	12.8	5.6	0.02
CSA-doped PANI	0	71.9	6.5	19.8	1.8
	0.5	81.9	12.1	5.9	0.1
	24	80.5	11.6	7.9	0.05

Notes: Quantification done using Thermo Avantage (v. 5.948) for the C1s, N1s, O1s, and $S2p_{3/2}$ peak areas; the general curve fitting procedure can be found in the main text and by comparison to Figure S1.

2. Depth Analysis of PANI films

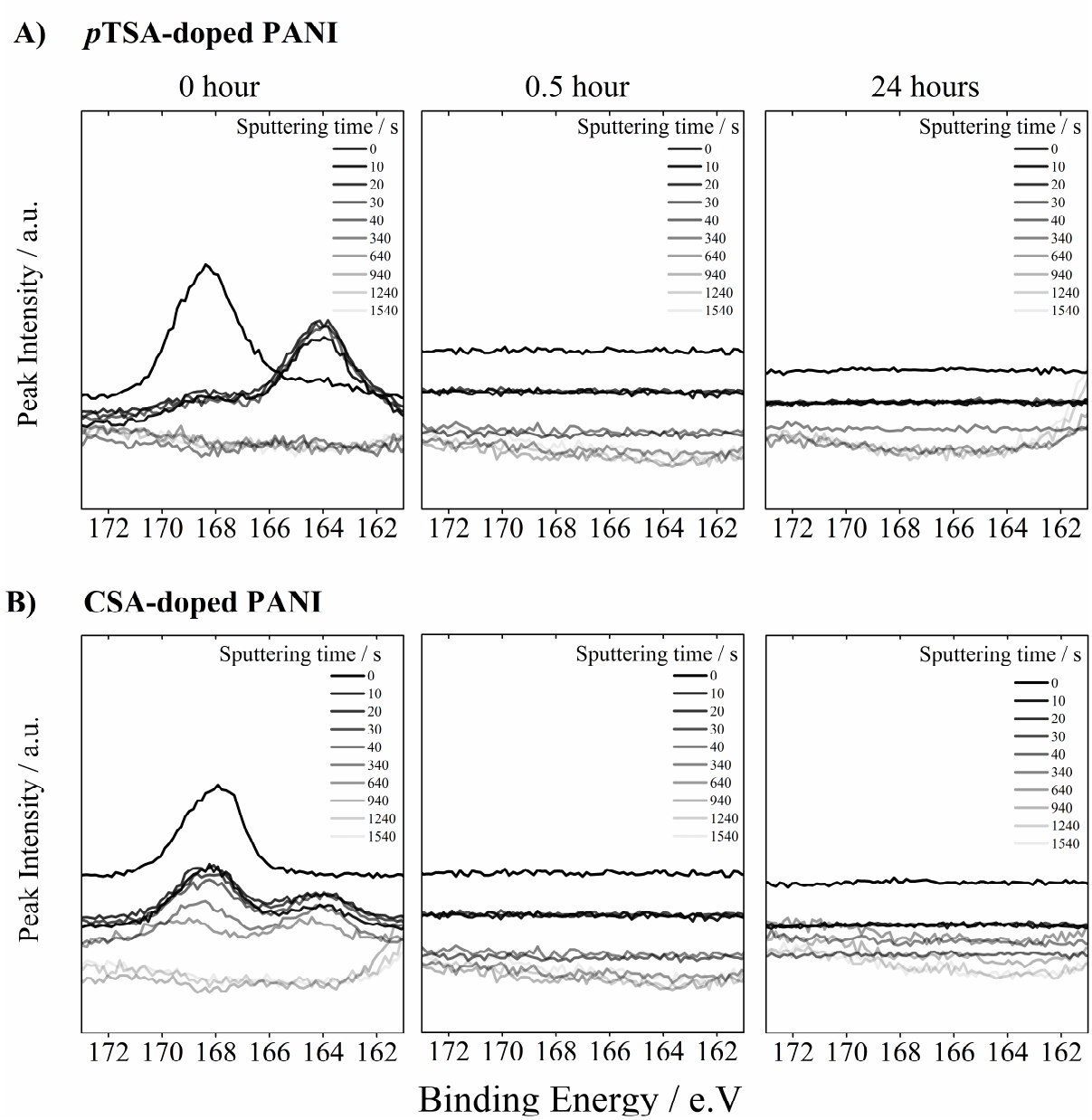

Fig S2: Depth analysis of S 2p signal with respect to Ar^+ sputtering time for **(A)** *p*TSA and **(B)** CSA-doped PANI at fabrication and following incubation in PBS for 0.5 hour and 24 hours.

3. UV-Vis spectra of undoped PANI

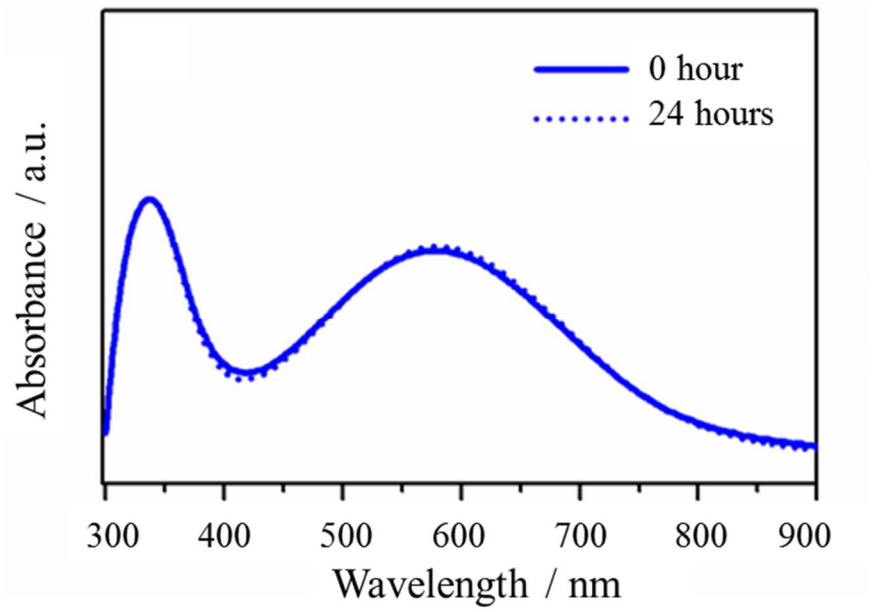

Fig. S3: UV-Vis spectra of undoped PANI. The spectra shows two main absorption peaks indicating benzoid and quinoid segments at 345 nm and 592 nm, respectively. Post incubation in PBS, no changes of the absorption spectra of PANI observed.

4. Thickness of PANI films

Table S2: The thickness of PANI films measured using surface profilometer (Dektak 150, Veeco).

Samples	Incubation Time (hours)	Thickness (nm)
Undoped PANI	0	72.8 ± 3.8
	0.5	76.1 ± 10.7
	24	73.6 ± 9.7
*p*TSA doped PANI	0	72.2 ± 10.1
	0.5	67.9 ± 12.3
	24	70.4 ± 10.6
CSA doped PANI	0	68.1 ± 5.6
	0.5	75.0 ± 5.1
	24	78.5 ± 10.7